

Ontario fish and wildlife Review

Vol. 15, No. 2, 1976





Surprise. Victor Solman, guest author, once advised prairie farmers to abandon sheep and raise coyotes. He sometimes talks to birds—on a tape, that is.

Surprise. Bob Alison's dip into history turns up instances of mass slaughter and wastage of buffalo and caribou by native peoples.



Surprise. For a writer who rambles, Laurel W-S comes sharp to the point. Farmers have the power to solve wildlife problems — but why should they?

No suprise. Our cover wood-chuck and red-winged blackbirds come from Erika Thimm.

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The goal of the Ministry of Natural Resources is to provide opportunities for outdoor recreation and resource development for the continuous social and economic benefit of the people of Ontario, and to administer, protect and conserve public lands and waters.



Ministry of
Natural
Resources

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Minister

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Deputy Minister

SECOND MARSH

Second Marsh, located between Oshawa harbour and Darlington Provincial Park, is the subject of much concern among environmentally conscious people in southern Ontario. The 204-acre marsh is owned by the federal government.

Second Marsh is the last wetland of good quality and size along the north shore of Lake Ontario between Niagara and Presqu'île, and for a number of reasons it is ideally situated.

Four-fifths of the wetlands in the immediate vicinity have already been lost. Oshawa harbour was originally a 459-acre wetland which was developed for industrial purposes and Second Marsh, itself, has been reduced by 306 acres. The net loss of 765 wetland acres is typical of what has happened to wetlands throughout southern Ontario. We have lost approximately 75 per cent of our original wetlands. Clearly we must preserve those that are left.

An essential point is that the emerging megalopolis of the Toronto-centred area, including Oshawa, will require large amounts of open space to develop a quality urban environment. What more useful kind of open space can be preserved in a community than a natural wetland with its attendant potential for educational opportunities, recreational opportunities, water quality improvement, water quantity protection, aesthetic appeal and biological productivity!

In the Review, we have repeatedly stressed the importance of wetlands as diverse and productive habitats for fish and wildlife.

The City of Oshawa has recently disregarded ecologically sound planning advice which would protect Second Marsh. The City has elected to zone it for industrial purposes under its new Official Plan. The major threat is that the area may be used to expand the existing harbour facilities. Since the Marsh is owned by the federal government, the City may not have the authority to rezone the area. The first legal confrontation is expected to occur before the Ontario Municipal Board late in 1976.

Wetlands need our protection. Environmentally concerned people are joining forces in a fight to the finish over this important issue.

PLAN OR LOSE

For centuries good farmers have followed the concept of sustained yield. By sustained yield we mean that a product can be harvested from the land base at regular intervals in perpetuity. This necessitates proper management of the resource base, the land, so that it is not damaged nor irrevocably depleted in any way. This is what farming is all about.

Biologists, like good farmers, manage the fish and wildlife resource on a sustained yield basis for recreational and commercial purposes. Theoretically, game species and economically valuable species can be harvested forever without damaging the resource base.

There are degrees of intensity of effort to which farmers and biologists must go to sustain the production of various crops or species. The more intensive the management, the greater the yield of the crops or animals.

Whereas farmers have had to manage their land intensively for years to maintain profitable farms in Ontario, biologists and foresters, for example, have had wild crops available for harvesting.

Recently the forest industry has experienced increased demands so that merely sustaining the yield from the wild forest crop is no longer adequate to satisfy an expanding market. Increased yields require increasingly intensive management and silvicultural practices.

We can only predict that hunting and fishing recreation and trapping and commercial fishing will soon be in a similar predicament. For example, ruffed grouse have so far required very little management in Ontario to sustain the hunting pressure put on them, but recently in some areas we have witnessed a decline in the moose herd and in lake trout populations because of various man-caused pressures.

The key to sustained yield is the management and maintenance of the habitat of the fish and wildlife species involved. Just as the farmer must manage the soil he cultivates, so the biologist must manage the habitat of fish and wildlife species which are cropped.

Fish and wildlife habitats will have to be managed intensively in the future, especially in southern Ontario, as a result of the pinch of scarcity which will come from the increasing population and development pressures on the land base. Inevitably fish and wildlife habitats will be destroyed. Biologists will be hard pressed just to maintain self-sustaining populations of animals let alone increase the yield on a dwindling land base to meet expected demands.

We can no longer afford to pick the wild crop from the land. We have to make the land produce what we need and want for the future. If we are to have sustained yields of fish and wildlife in future, we must be prepared to put the necessary money and effort into managing their habitats. But first we must plan and regulate the use of our land so there will be places to manage for fish and wildlife forever.

Fish and wildlife habitats, if left unprotected in land-use plans, will be the first areas to succumb to land-use pressures.



White-tailed deer visit a fruit orchard in winter to eat the young twigs.

FEUD IN THE FIELDS — WILDLIFE VS FARMERS

by Victor E. F. Solman

Co-ordinator, Environmental Impact Assessment

Canadian Wildlife Service, Environment Canada

EVER since man became a sedentary agriculturist instead of a roving hunter and gatherer he has found that his crops are attractive to wildlife. The early farmer did his best to protect what he grew from bird and mammal damage. In many areas he took a philosophical approach and concluded that the wildlife had a right to a part of the crop and that he should not be too concerned about small losses. He believed it was a poor farmer who couldn't afford to have a few birds and mammals living off his crop. Besides he found some birds and mammals interesting and liked to have them around. There are references to that sort of thing in the early writings of many languages. I am sure the problem and some solutions are very old.

In the past 50 years, as agriculture has become more intensive and expensive and more a business than a way of life, people have looked more closely at the costs of wildlife damage. They have tried to reduce damage to increase profits and lower operating costs.

The same thing has happened with plant diseases and insect damage.

We have reached a situation where losses caused by weather, floods and other so-called Acts of God can be compensated by insurance. We have perfected chemical and physical control methods for insects, molds, fungi, plant diseases and a variety of other things which reduce agricultural yield. There is now pressure to develop better methods of controlling damage caused by birds and mammals.

My first involvement in wildlife damage control came almost 30 years ago. Canadian Wildlife Service biologists were asked to look at a problem created by blackbirds feeding on experimental corn plots. Those plots, at the Central Experimental Farm, were being used for corn genetics studies and each ear of corn was important. The damage caused by blackbirds to individual ears made it difficult to assess the results of the experiments.

Another biologist and I were assigned the

task of developing practical methods of keeping red-winged blackbirds out of the experimental corn plot. We could try things that would not be practical to use where corn was grown for silage or table use and where values per ear were much less than in the experimental crop.

We soon learned that the distance from the experimental fields to marsh areas, where blackbirds were produced, and to roosting trees were important contributing factors in the damage. We could physically exclude blackbirds from the fields by putting nets over the top of the corn plants. We could keep them out by putting up spinners and streamers which moved in the wind — the sort of thing used around service stations and used-car lots to attract your attention. Those worked if you used enough of them and if the wind blew frequently enough.

We found, as have many farmers, that you can use shotguns and automatic exploders to obtain some measure of control but the amount of manpower and equipment needed may cost more than the value of the crop being protected.

On one occasion we painted corn cobs different colors. We knew that some birds are very much influenced in their feeding habits by the color of food. Our results showed that if you painted the corn cobs white, fewer would be damaged than if you left them green or painted them almost any other color. The experimental corn cobs could be protected by going through the field and spraying the cobs with white paint which the birds found unattractive.

One thing we learned from the studies was that the birds have a strong incentive to feed on corn before it is ripe — when it is in the milk stage. Under these conditions once a feeding pattern is established in a field, it is extremely difficult to break it up. It is not difficult to prevent the formation of the feeding pattern if you start early enough and if you are persistent enough to prevent the birds from beginning to feed.

Our colleagues in Germany, who deal with starling damage to vineyards, find the same thing. Once the starlings get into the vineyards and begin feeding, you may as well forget about a harvest. If, on the other hand, you can keep the starlings from entering the field in the first place, you can protect the crop regardless of the number of starlings that may be present in the area.

Our German colleagues use the communication mechanism of the starling. They make

good tape recordings of the appropriate warning cries which are taught to the young starlings at a very early age. By playing the tapes they are able to turn back starling flocks that approach the vineyards and thus have complete protection from starling damage. Without that protection, grape losses would be high.

Unfortunately we have not yet found a warning cry in the red-wing blackbird's vocabulary that works as well as the starling's warning cry. In our experience some bird species have warning cries which can be tape recorded and played back and which work effectively. Others unfortunately do not seem to handle their major communication problems in the same way and are much more difficult to deal with.

What other kinds of agricultural damage are we faced with? Damage may be almost as diverse as the kinds of crops and the kinds of areas in which they are grown. Looked at on a national basis, you go from robin damage to blueberries in the maritime provinces, through corn damage by blackbirds in central Canada, to duck and crane damage to grain on the prairies, to starling damage to blueberries on the west coast.

If you consider mammals, almost any market garden crop can be damaged by rabbits, voles, mice, squirrels, raccoons or groundhogs, and on the prairies by pocket gophers and ground squirrels. If you consider big game, you think of deer damage to market gardens and orchards, elk damage to hay stacks on open ranges in western Canada, bear damage to bee hives, coyote damage to sheep, and so it goes.

When you mention bird damage to me after 30 years association with migratory birds and the Migratory Birds Convention Act, I immediately have a vision of a swathed field of prairie grain with 5,000 mallard ducks happily feeding on it. Grain damage by ducks did not happen 80 years ago when there wasn't any grain on the prairies. It wasn't much of a problem before World War II even though grain acreage increased with the settlement of the country and the increasing world market for grain. Prior to World War II much of the prairie grain was cut and bound into sheaves and the sheaves piled into stooks to dry in the conventional manner long used in Europe and eastern Canada.

During the war manpower became scarce and it was necessary to mechanize grain harvesting. Swathing of grain became common.

Swathed grain is cut and laid in a strip on top of tall stubble so that it can dry effectively before it is picked up for threshing. In theory a combine harvester is an effective machine which cuts the grain and threshes it in one operation. In practice many varieties of grain do not ripen uniformly enough to permit cutting and threshing in one operation. In the old days the grain was cut and stooked and then threshed later with a stationary threshing machine.

The present technique is to swath the grain, let it dry in swath, and then thresh it with a combine that moves through the fields and picks up the swath directly. The technology is excellent, but while the grain is in swath it is easily fed upon by waterfowl. If all goes well the period in swath is short. If the timing is right the ducks may not develop a feeding pattern before the grain is threshed. If all goes wrong, as it often does, you get rain or snow on the swath, drying time is extended and the waterfowl have a feast. In single years damage has run up to 10 million dollars worth of grain and that was years ago when grain was less expensive than it is now.

What can you do to keep ducks out of swathed grain? Well, like starlings in European vineyards, once they get in and start feeding it is hard to dislodge them. You have to try to keep ahead of them, prevent them

from getting in, in the first place. This would be easier to do if your grain field was outside the kitchen window so you could easily watch it. On many prairie grain farms you may have fields scattered over a hundred square miles of landscape. It is hard to keep your eye on all swathed fields at the same time even with co-operative arrangements between landowners.

If you have a particularly vulnerable field, though, and are willing to spend the time and effort to put in a dense network of gas cannons with electronic controls to vary the interval between explosions so the ducks don't get used to the steady rhythm, you can keep waterfowl out of the swath until you have a chance to thresh it. All you are doing is denying the birds use of one area. You have to realize that you must only protect the areas where the crop is vulnerable and leave all the other areas for the birds to use when they are forced to stay out of protected crops.

If there is a hunting season at the same time, that complicates the situation because the birds may want to enter a crop to escape from the hunters.

An alternative to crop protection is to set up an insurance scheme so that if the farmer loses his crop he is at least partially reimbursed for his cost. That has been done under a variety of schemes. Insurance is not a sub-



Pasturing geese — a pleasure to view but a problem to feed.

titute for control of damage. It is something to tide you through an emergency once, but is not something to be relied upon as a means of dealing with a problem that goes on year after year.

Insurance does not solve the problem. The real answer is a more effective method of keeping the birds out of the crop and more effective work in developing crop varieties that are more resistant to being fed upon by wildlife and that ripen at times when wildlife is less abundant. It includes development of technology which makes the crop less vulnerable to damage by wildlife. When we suggest that combining and swathing should be changed for some other technique, we are not popular among our agricultural engineering friends. But the best answer to the problem may lie in that direction.

We have talked about some kinds of damage and some of the reasons why they occur. What about the situation in general? When you look at the situation nationally and ask agriculturists to estimate what dollar value is involved, they come up with figures in the hundreds of millions of dollars per year. Nobody has good data on total costs of damage. A real need at the moment is to get better statistics on what damage actually occurs. We are working on that with our colleagues in the provinces.

A part of the damage goes on in hay fields where voles, and in the west, pocket gophers, eat a portion of the hay estimated at between one and five per cent. That may not sound like much but the annual value is about 30 million dollars. The damage is diffuse and covers a wide area. It is likely that any control method would cost more to operate than the price of the hay that is lost. We tend to leave that kind of problem alone now and concentrate on those that appear easier to deal with.

Blackbird damage to corn, particularly table corn, is heavy in local areas and we think there is a possibility of controlling it. The problem arises when you put corn fields in areas where blackbirds are present in numbers. Blackbirds have increased in numbers in recent years due to changes in water levels and in some cases due to a change in agricultural practices. Years ago in the State of Ohio very little alfalfa was grown. Over a period of ten or fifteen years alfalfa became very popular and by 1966 something like a million acres of alfalfa were being grown.

Blackbirds, which nest in areas with high humidity, found that alfalfa fields provided good nesting areas. With blackbirds nesting at a density of six nests per acre in alfalfa fields, Ohio was producing something like 25 million additional blackbirds each year to help the farmers harvest their corn. You have a situation where maybe the same farmer was growing alfalfa on one part of his land and corn on the other and having increased blackbird damage to his corn without realizing that some of the blackbirds were coming out of his own alfalfa fields.

Maybe we are trying to grow crops in the wrong places. Maybe we are putting attractive things in the way of wildlife. Some of the early French explorers in southwestern Ontario 300 years ago talked about the great marsh areas near Lake St. Clair and pointed out that because of the very large numbers of small birds in that area it would never be very useful for agriculture because there would be so much bird damage. Some of the major corn areas of Ontario are now in that area. Those early explorers were right—the damage does occur. The operators are obviously making a profit in spite of it or they wouldn't go on growing corn there.

How do you resolve that kind of problem? I think mainly you resolve it by sorting the problems that can be dealt with from the ones that are beyond our technology at the moment. Through a co-operative effort between farmers and wildlife biologists you try to work out the most effective means of controlling the damage to the agricultural crops without trying to eliminate the wildlife which may be causing damage.

Wildlife can be a nuisance or a great benefit depending on where it is at any particular time. In the past when attempts have been made to wipe out one kind of wildlife, the problems caused by success are often greater than the problem being dealt with in the first place.

On the prairies they used to worry about coyote damage to sheep. They found when they removed coyotes from certain areas they got in exchange for coyotes a great increase in mice and voles. The mice and voles ate enough grass and hay to compete seriously with the sheep. They had merely substituted one kind of wildlife problem for another. I hope we are smart enough now to avoid doing that sort of thing.

When we look at possible solutions to wildlife damage problems in agriculture, we



Growers must guard against fruit-loving robins. — Photo by W. K. Colegate

always look first at solutions which don't involve trying to get rid of the problem animal. I obtained a mixed reaction on one occasion when I suggested to a group of farmers who were losing \$20 sheep to coyotes that they might be better to farm coyotes than sheep because a coyote pelt was worth about \$35 and the country was better for coyotes than it was for sheep. They might have been able to make a very good thing out of raising coyotes.

In the Wildlife Service we are accused of not being farmers and not thinking like farmers. We are also accused of not being duck hunters and not thinking like duck hunters. Both accusations are true in part because we try to take a dispassionate view of wildlife. We realize that wildlife has been here since the beginning of time and will be here long after we are gone. We might as well accept it as a part of the environment and learn to live with it and in some cases to profit from it.

Some agricultural problems spill over into other businesses. The farmer who has black-bird damage in his cornfields near an airport runway also causes a severe problem for aircraft using that airport. Birds and aircraft turbine engines do not work together very well. One of our big jobs is keeping birds and aircraft apart. That improves safety and

reduces airline operating costs. The farmer who flies on a commercial airline, or for that matter in his own light aircraft, may not realize that birds attracted by his crops near the airport may increase the cost of air travel and endanger his own life.

Birds cause millions of dollars of damage to aircraft each year and have caused the loss of more than 100 human lives in aircraft accidents in the past 15 years. Our work has reduced both the hazard and the dollar costs but the problem is still there.

The Wildlife Service tries to be realistic about the value of any particular kind of wildlife. Beaver produce nice shiny fur which sells for as much as \$60 a pelt. Beaver also build dams which flood fields, railways and highways. There may be as many beaver in Canada now as there were when the fur trade was just getting started. In those days beaver were one of the most important assets of Canada and it was the fur trade that opened up a lot of Canada. Now, partly because you can make money in many ways which are physically easier than trapping beaver, we have beaver all over the place.

The beaver is Canada's national animal emblem. Is it good or bad? It depends on whether you are a beaver trapper or a farmer who has just had a crop washed out by a beaver dam.

FISHING FOR FLAVOR — BURBOT

by C. R. Jorgensen

Biologist, Lake Nipissing Fisheries Assessment Unit

THE burbot, *Lota lota*, is better known to Ontario anglers as ling, freshwater cod or eelpout. Elsewhere it may be called lawyer, loche, methy, lotte or maria, its commercial name.

The burbot is distinguished from all freshwater fishes by the single small, but well-developed, barbel on its chin. It is an elongated fish with the front half rounded while the tail portion is laterally compressed. The dorsal fin is approximately half the total length. The color ranges from light brown to almost black, and the skin is smooth with small scales which are scarcely noticeable.

Spawning occurs from January to March in rivers or over rocky lake bottoms.

The burbot is a relative of the Atlantic cod and its liver provides an oil similar in all respects to cod liver oil.

Wherever and whenever angling is permitted, there are no restrictions on fishing this widely distributed freshwater cod.

In spring and fall, burbot may be found at all depths and can usually be angled successfully in early morning and evening in shallow waters near the mouths of tributaries to lakes. During the summer, angling success is at a low ebb but burbot can be taken on hook and line in the deep, cool water they seek at this time of year.

It is during the winter that burbot are most likely to be caught. Anglers take many when fishing through the ice for other species in 15 to 75 feet of water.

A small painful of salted minnows should be scattered over the lake bottom below the fisherman's hut, and a baited hook is allowed to rest on the bottom.

Because of the absence of small bones, excellent fillets can be made from the burbot. Slice along the backbone on each side of the dorsal fin and fillet out the meat.

Burbot may be salted like Atlantic cod and are equally good. They may also be pickled or preserved as 'strip fish' and they have been smoked successfully in some instances. Some people use burbot to make gefiltefish.

Remember that this ugly codling provides food of high quality. In Europe the burbot is highly regarded and commands a good market. Burbot is as good as cod in fish loaf and fish cakes. Excellent recipes have been

prepared for the cooking and canning of burbot livers and serving them in liver loaf, soups and fillings for tomatoes.

Burbot eggs or roe are considered a delicacy. When gutting the fish, make sure that the membrane sac around the eggs remains intact. Place the eggs in a hot skillet containing clean vegetable oil. Fry to your satisfaction and add a seafood of your choice.

BURBOT COOKERY

Burbotburgers

2 pounds burbot fillets

4 slices dry bread

1 medium onion

1 tsp. salt

1/8 tsp. pepper

1 egg

Grind fillets in meat grinder using fairly coarse blade, grind bread and onion, adding 1 whole egg, salt and pepper, mix together. shape into balls about 1 1/2 inches in diameter, put into frying pan and flatten a bit with fork, use vegetable oil for frying. Fry approximately ten minutes to each side until brown. Makes 6 servings.

Ling Thermidor

2 lbs. ling (burbot)

2 1/4 cups milk

1 1/2 tsp. salt

1/8 tsp. pepper

1/2 cup lemon juice

cayenne

1/2 cup butter

1/2 cup flour

1 1/2 cups grated cheddar cheese

paprika

Heat oven to 350 degrees. Roll each fillet from narrow end and set each roll on end in a 12 x 8 x 2 inches baking dish. Pour milk over fish and sprinkle with salt, pepper and lightly with cayenne. Bake 30 min. or until the fish flakes easily. Drain milk off fish into a cup.

Turn oven to broil. Melt butter in top of double boiler. Stir in flour. Add milk from fish and stir to blend. Cook over boiling water, stirring constantly until thick. Add cheese and stir until melted. Add lemon juice; pour sauce over fish and sprinkle with paprika. Broil until cheese sauce bubbles and is lightly browned.



Harvesting Niagara grapes. — Photo by Ted Grant, Information Canada

THOUGHTS WHILE RAMBLING ON OTHER PEOPLE'S PROPERTY

by L. Whistance-Smith

Environmental Policy Biologist, Wildlife Branch

BY the early part of the 19th century, settlers were busily clearing the forests of southern Ontario for agriculture. The land was good for farming; the soils were deep and fertile and the climate was favorable. There seemed no limit to the potential and the vastness of it all. One hundred and fifty years later, the resource has been delimited and competition for the land is fierce. Wildlife habitat has been drastically altered or destroyed as agricultural practices have been intensified and agricultural land has been given up for urban purposes.

The past several years have seen increasing concern expressed by planning experts and news commentators about losses of prime agricultural land through urbanization. The same process affects wildlife habitat so there is some common ground on which agriculturists and wildlife managers can be allies today.

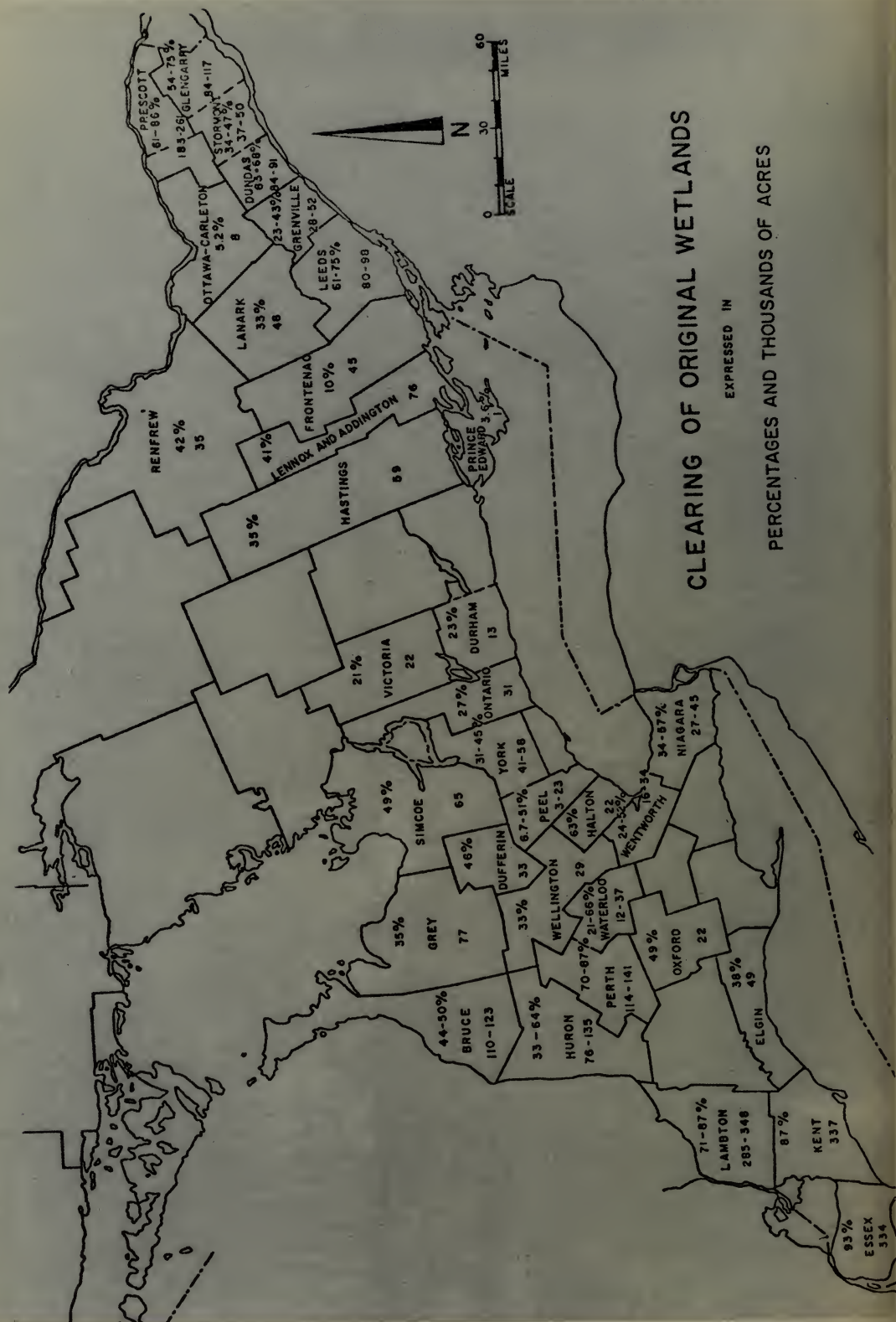
Urbanization involves many uses of land. It results from population growth and spreads

like cancer with its demands — industrial, residential, energy, transportation and communications.

Twenty-five urbanized townships in southern Ontario contained eight per cent of the region's Class I, II and III agricultural soils in 1941. By 1971 southern Ontario had 95 urbanized townships which contained 31 per cent of the same classes of arable soils — a 288 per cent increase in urbanization in 30 years!

In 1950 cities of more than 20,000 people occupied 0.7 per cent of the land area of southern Ontario and by 1971 they occupied 5.3 per cent. In 1973, southern Ontario had a population of 7.2 million, about 90 per cent of the provincial total.

Urban low densities cause urban sprawl. In 1951 there were 13 to 14 people per acre on urban land — the ideal density of well-planned cities according to many planners. By 1971 the density had sprawled to four or five people per acre — more land for each



city dweller but less land for agriculture and wildlife.

Part of the urban sprawl is industrial development which occupies large tracts of land and frequently introduces degrading substances into natural systems.

Highways and hydro transmission corridors, where right-of-ways are maintained in herbaceous growth, take more land away from agriculture and wildlife, especially wildlife.

Merely by occupying the land, urban-related development destroys wildlife habitat. What's worse, good wildlife habitats are often the targets of development. For instance, wildlife managers are especially concerned with the preservation of southern Ontario's remaining wetlands. But a 1975 survey of wetlands showed that urban pressure was great in and near the Metropolitan Toronto area.

The insidious encroachment of urban-related development on rural lands is detrimental to both agriculture and wildlife. But agriculture, itself, further reduces the land available to wildlife and wildlife-oriented recreation.

Several programs of the Ministry of Natural Resources can harmonize with the dominant agricultural use of land. These include woodlot and shelterbelt management, wildlife production, and certain extensive outdoor recreational activities.

Wildlife production and wildlife-based recreation on agricultural land typically involve the so-called unimproved or uncultivated land. Unfortunately, it is just these kinds of lands, mainly old fields, bush and wetlands, that are being lost to wildlife.

Proximity to urban areas discourages farmers from keeping their land in agriculture. They can make money and retire by selling their land for urban development.

Census data show that from 1951 to 1966 the net 'losses' in improved and unimproved farmland were 550,000 acres and 1,725,000 acres, respectively. The figures show that where improved land was lost, the loss was compensated by cultivation of formerly unimproved areas, and so the greater loss by far was in the unimproved lands which are useful to wildlife. In effect, wildlife habitat has been lost to more intensive agriculture.

The accompanying charts are reprinted from Planning for Agriculture in Southern Ontario, ARDA Report No. 7, 1972.

Farming practices have also affected wildlife habitat. Early agriculture greatly increased the diversity of habitats and this diversity was maintained in most areas until the 1930s or '40s. The forests were replaced by a productive field-forest ecosystem that supported both an abundance and a variety of wildlife and an increasing, but largely rural, human population. Fields were small and crops were diverse.

Then came the post-war population boom which increased the demand for food and hastened the modernization of agriculture.

To maintain farms as economic units, farmers had to change their methods. They converted to new, intensive methods so rapidly that agricultural production has doubled since 1950.

Associated with the increasing efficiency was the switch from the mixed farm of the past, with its opportunities for good land management, to extensive monocultures relying on artificial fertilizers and insecticides. The change in production practices has facilitated, and has been facilitated by, the move to increased mechanization and larger machines—machines that require large fields with a minimum of interruption from fence-rows, woodlots and wetlands. The latter features have all but disappeared from the landscape in highly productive areas.

An obvious result of these changes was the adverse effect on wildlife. Populations declined in size and diversity as their habitat vanished. The features that made early farmland so attractive to wildlife were the features first destroyed by the new efficiency in agriculture. The loss of fencerows, woodlots and wetlands; spraying for weeds along roadsides and ditches and in field crops; extensive fall ploughing; and the application of insecticides — all have removed much of the food and shelter needed by wildlife.

Traditionally, agriculturists have viewed wetlands as potentially productive farmland and have consistently drained and ditched them. Certainly, some of this zeal has been warranted as evidenced by the vast production of foodstuffs in Holland Marsh and some areas of southwestern Ontario.

One of the major effects of wetland drainage and channelization is the associated clearing of trees and destruction of wildlife habitat. Almost all wildlife from deer to cottontails, from grouse to cardinals and chickadees, are dependent on wetlands at some time during the year. The drainage of a marsh results in the loss of wildlife not



LAND USE DECISIONS

Clockwise from right

The bare facts of the problem. Good for farming but as for wildlife — forget it. Photo by J. de Visser, Information Canada.

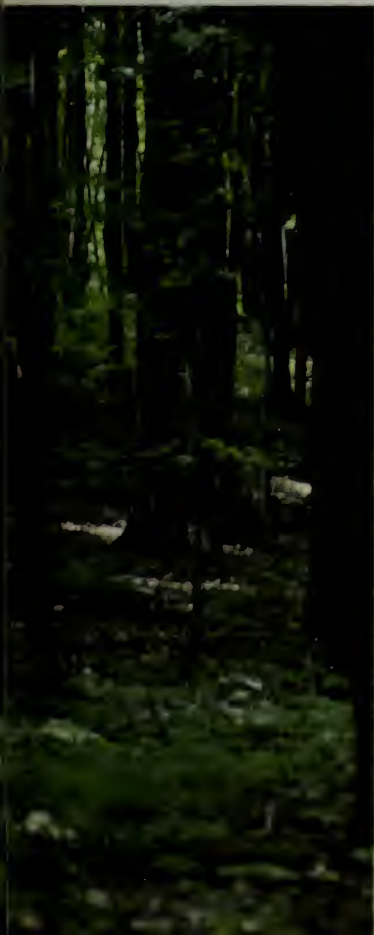
Pockets of unfarmed land can be excellent wildlife habitat.

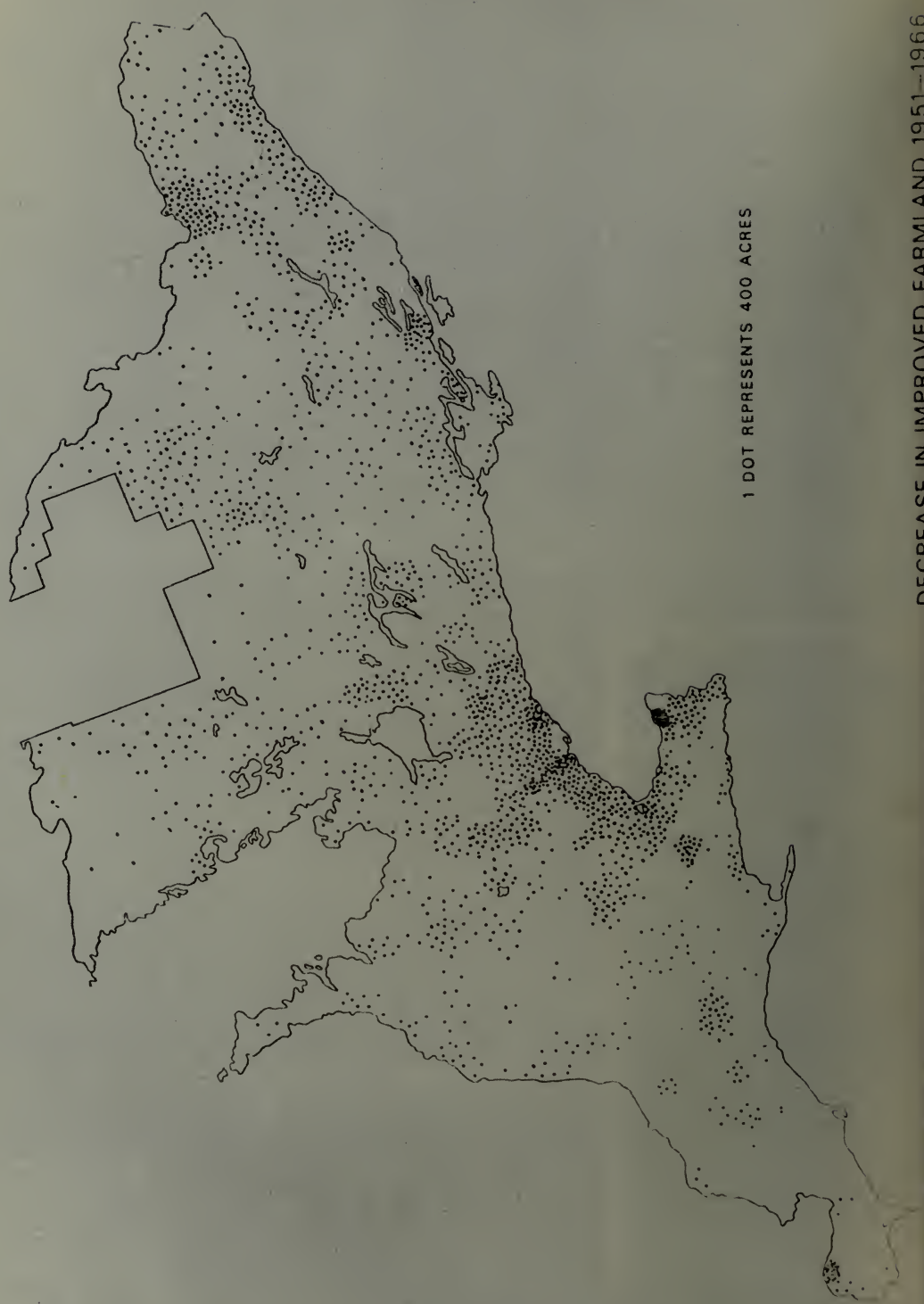
Pesticide — or pestilence? Photo by Gar Lunnay, Information Canada.

Untended hardwood bush, lacking new growth, lacking wildlife. Too common a sight in Ontario. Photo by L. Whistance-Smith.

Clean farming. Where can wildlife den, feed or travel? Photo by V. P. Husek.

Left: a pleasing prospect. Good interspersion of small fields, woodlots and fencerows.





1 DOT REPRESENTS 400 ACRES

DECREASE IN IMPROVED FARMLAND 1951-1966



Waste land can be a wonder land for wildlife — but they can't use tobacco fields.

only in the marsh itself but in much of the surrounding upland.

Originally southern Ontario had about 5.7 million acres of wetlands. Organic soils and marshes made up about 1.8 million acres of this total and most of it would have been wetland wildlife habitat. An estimated 2.7 million acres, nearly half the total, were cleared by 1950. The losses of wetlands have increased by leaps and bounds since 1950 but complete figures are not available.

Woodlots and their edges are also important to wildlife because they provide food and cover for a variety of species. Most farmers ignore their woodlots or manage them for strictly economic reasons. Their woodlots are often mature with closed canopies which eliminate the undergrowth that supports many wildlife species.

At this stage, the woodlot edge is the most productive area for wildlife. However, the farmer will usually try to keep the edge strip of new growth to a minimum because it 'wastes' productive agricultural land.

Today less than 25 per cent of Ontario south of the Precambrian Shield remains wooded. The more intensive the agriculture, the fewer woodlands remain. These and other important facts were revealed in a survey of rural lands and landowners conducted by the Ministry of Natural Resources in southern Ontario in 1972.

Of landowners holding a minimum of 50 acres, 14 per cent were absentee owners. Of these, 25 per cent had bought their land in the 4½ years immediately preceding the

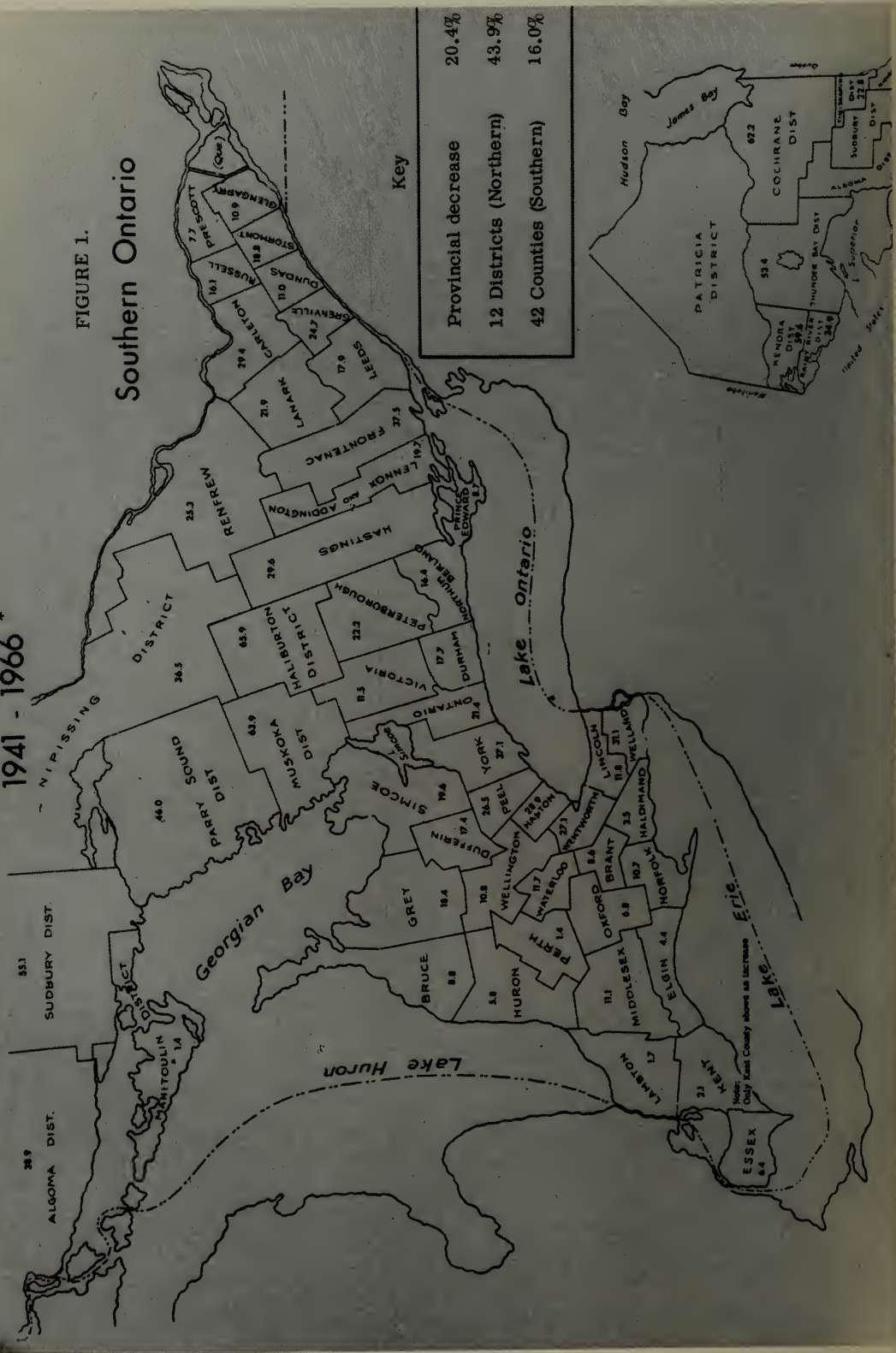


survey, but more importantly these acquisitions represented more than 38 per cent of the total acreage acquired by all landowners during that period.

Significantly, farmers had the smallest average woodland holdings at 49 acres while 'businessmen' owners averaged the highest with 141 acres. One out of every four woodland owners wanted to clear at least part of his woodland for alternative uses.

1941 - 1966 *

FIGURE 1.
Southern Ontario



Note:
Only East County above as increase

Three-quarters of all rural properties were used for recreational activities and hunting was the most common. It occurred on 53 per cent of all rural properties, far ahead of the 35 per cent for snowmobiling, the second most common activity.

Other activities, directly or indirectly related to wildlife, were hiking and walking (28 per cent), trapping (12 per cent) and nature study (nine per cent).

In summary, fragmentation of rural land-holdings is occurring and the farmer must have little concern for woodland because this is the land he will sell off. Therefore, farmers, it may be generalized, are not usually interested in wildlife production on their lands. Non-farmer owners are more concerned with their woodlands but their numbers are relatively small. These people are more likely than farmers to carry out woodland management for wildlife and other benefits. Since hunting is a major recreational pursuit on rural land, we could conclude that woodland management for wildlife should be encouraged.

Farmers are also not interested in maintaining another feature important to wildlife — the fencerow. In fact, the Ministry of Agriculture and Food encourages the destruction of fencerows by paying 40 per cent of the cost of removal up to \$3,000. Uncounted miles of fencerow habitat have been lost, most noticeably in intensively-farmed southwestern Ontario.

Hedgerows are useful in preventing soil erosion by wind and water and they provide food, cover, travelways and nesting and denning sites for many species of wildlife. Furthermore, they are aesthetically pleasing features of the landscape.

Unfortunately, hedgerows and overgrown fencerows are viewed as impediments to intensive agricultural practices and the farmer will frequently remove them.

Farmlands can be rich in wildlife, especially if farmers leave plenty of unimproved land on their properties. But farmers have not planned, and cannot be expected to plan, their lands as natural havens for wildlife. Yet when a new farming practice is less favorable to wildlife than an old one, there is a tendency for hunters and naturalists to blame the farmer.

Since farmers (1972 survey) control 64 per cent of the land in southern Ontario, in theory they have the power to provide the environment desired by the citizens of the southern part of the Province.

Is it fair to ask farmers to retain what they consider uneconomic features such as hedgerows, fencerows, woodlots or marshes? In general, no. But if the whole community were considered, the opposite might be true. Perhaps, then, the community or local groups interested in wildlife should consider compensating the farmer for retaining and maintaining wildlife habitats.

This leads us to think about broader solutions to the problems of land uses in Ontario.

More than 80 per cent of Ontarians live in urban situations. They have no experience with farming but many take pride and delight in growing flowers, vegetables and fruit in their private yards. They have no direct tie with the land but they frequently visit the countryside on holidays and weekends.

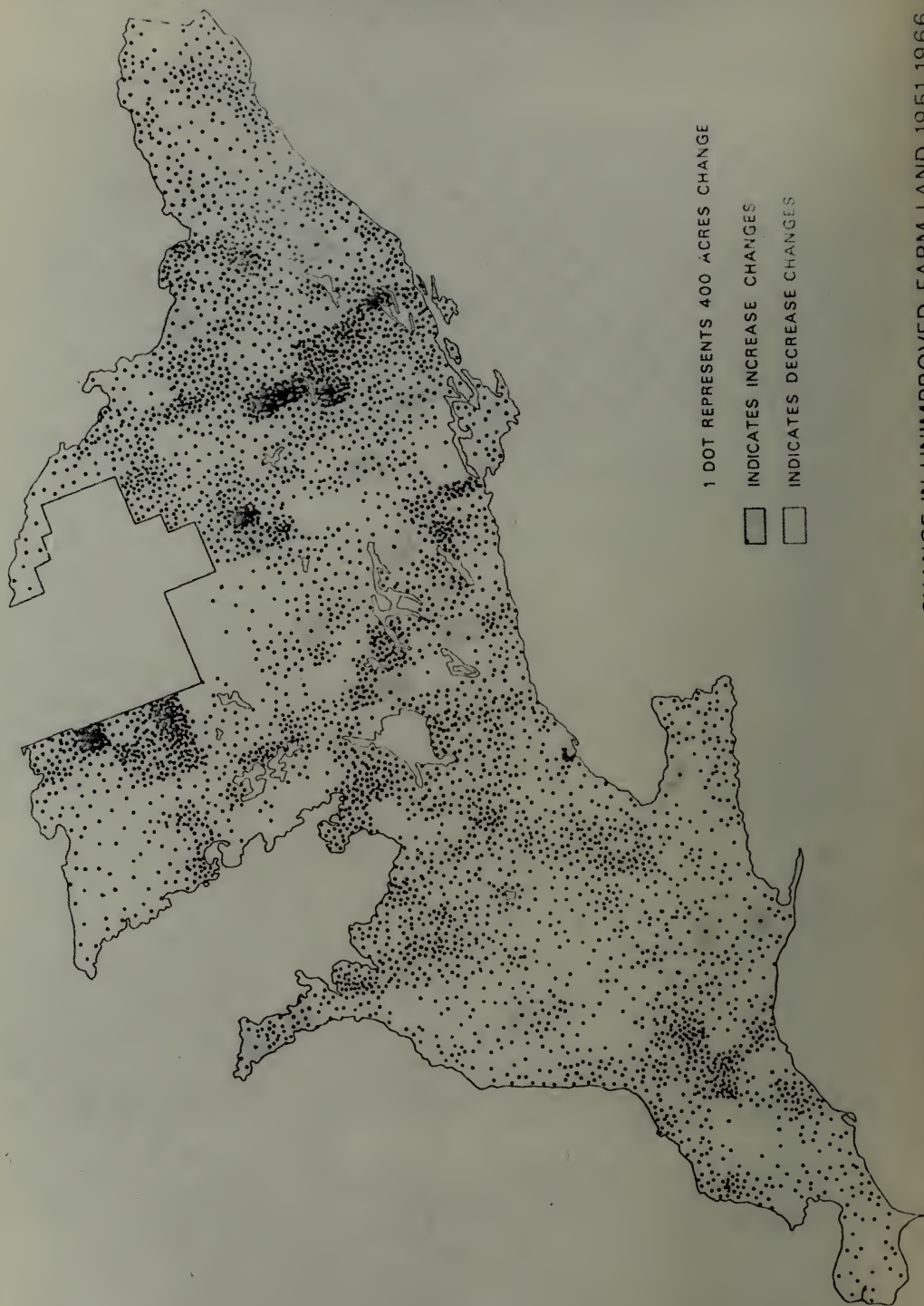
Most people recognize they have no legal right to the land but feel they should have some say in what happens on it. It is not surprising that misunderstandings occur since urban people can have a strong delight in landscapes and natural history without any knowledge or appreciation of agriculture or what it is like to be a farmer.

A major problem facing the people of southern Ontario is how to plan for population growth and economic, urban and industrial growth, and at the same time preserve lands for agriculture, lands for wildlife, and lands for recreation. The awesome scale of developments is exemplified by the Stelco and Dofasco proposals along the north Shore of Lake Erie, the Ford automotive plant near St. Thomas, the high-voltage hydro transmission line from Nanticoke to Toronto and London, and the new community at Pickering.

Wildlife habitat in southern Ontario is closely allied to the agricultural situation. Without proper planning, we are fighting a losing battle in our agricultural and wildlife conservation programs. We must discard the laissez-faire policies of the past. What is done with the landscape in the next two or three decades will decide the fate of both agriculture and wildlife.

Dr. C. H. D. Clarke, former Chief of Fish and Wildlife in Ontario, has summed up a philosophy for ecological land-use planning as follows:

"The attempt to project one's ego over the countryside is based on the fallacy that we own it and are apart from it, when actually it is a system to which we belong, and whose workings we should understand before we tamper."



CHANGE IN UNIMPROVED FARM LAND 1951-1966

INTROSPECT

*A personal opinion
not necessarily endorsed by
the Ministry of Natural Resources*

NATURE ABHORS A LAWN

by A. A. Wainio
Biologist, Maple District

"Where have all my birds and rabbits gone?" That's what the lady asked the visiting biologist.

The answer was obvious. She had recently moved to the country and, being lonely for the city, had cut all the high grass, weeds and brush between her porch and the concession road so she could see the cars go whizzing by. But all the small songbirds, chipmunks and rabbits had fled to the adjacent unkempt lots.

Another rural newcomer was asked why he regularly cut the grass on his three-acre front lawn far from the city. He could only shrug and say "Because all my neighbours do it."

In the rolling Albion Hills north of Toronto where much of the forest cover is still left, one landowner has created another city park on the 10 acres surrounding his home. All that mowed grass and geometrically planted trees are depressing, but what is appalling is that he cuts the grass on the road shoulder. He's working free for the township while destroying wildlife habitat.

Large spreading lawns are appearing all over the rural landscape, changing the woodlands and fields to artificial gardens. The grass cutters are not aware of the damage they inflict on the natural faunal and floral communities they fled the cities to admire.

A host of birds, small mammals, snakes, insects and small flowers inhabit the open fields, but when these open spaces are attacked with herbicides and power lawnmowers the diversity disappears.

A lawn may be in harmony with man's

view of a cultured landscape but it cannot survive untended. Nature abhors an artificial monoculture. A trimmed lawn may be considered a vacuum, one that is soon filled by weeds, shrubs, saplings and trees.

My complaint is with large lawns. Why must landowners have them? Do they play football? Are they in the sod business? Do they collect dew worms and sell them for bait? Do they want their own golf course?

Lawns have always been present in the country but were much smaller when the mowers were powered by muscle. With the advent of power machines, lawns suddenly expanded to encompass whole fields. If you own a riding mower, your lawn is too big.

Most people leave the city to get closer to Nature but they defeat the purpose of their move by creating huge lawns.

Many rural landowners want a fish pool but once the pool is built they manicure its surroundings. Shrubs and trees are often removed, leaving the pond surrounded by a large mowed lawn providing no shade for the water. Woodlands near the house are cleaned of undergrowth to make a park. Weed patches by trails and in odd corners, so valuable as cover, feeding areas and nesting sites for small birds and mammals, are sprayed or cut.

On a hundred square yards or so of lawn, such practices are tolerable, but when carried out on a large scale they become another example of man's failure to co-operate with Nature.

With subdivisions, highways and agricultural practices gobbling up wildlife habitat, it is sad that individual householders end up doing what they condemn in developers and others. It seems they too want to assault Nature and keep her at bay.

If this trend continues, wildlife habitat will be reduced as quickly as these people tidy up nature.

Gardening with wildlife in mind can have fulfilling rewards. By allowing some areas near the house to remain wild, rural householders will be blessed with a diversity of life, both faunal and floral, which will delight their eyes and imagination.

HAWK CLIFF

Hawk Cliff, located south of St. Thomas at the end of Elgin County Road 22, is perhaps the best place in Ontario to view the hawk migrations in autumn. Hawks congregate here because of the steep cliffs, the varied topography and habitat, and the inability or unwillingness of raptors to migrate across wide bodies of water. A special Viewing Weekend is held each year in September, but the public are encouraged to visit Hawk Cliff throughout the migration period from late August to late November.

— Aylmer District

FROM KING TUT TO QUEEN VICTORIA

*A Brief History of Early Wildlife Laws by R. M. Alison
Waterfowl Biologist, Wildlife Branch*

MODERN game laws undoubtedly descend from early hunting customs. Early tribes observed various hunting taboos, and it is believed the prevalent taboos preserved breeding stocks, thus giving their fortunate practitioners the advantage over other hunters with inferior taboos — inferior, that is, from the management point of view. Thus, hunting traditions probably evolved in the process of inter-tribal competition.

Probably one of the first recorded hunting restrictions occur in the Mosaic Laws (Deuteronomy, 22:6) wherein Moses decreed that, although it was permissible to take the eggs and young from the nests of birds, the adult females must be spared. It is apparent that the conservation of breeding stock was intended.

Discoveries among the artifacts of King Tut-ankh-Amen's tomb indicate that the early Egyptians were more concerned with art and religion than with outdoor activities, but they were evidently fond of fishing and hunting. The species they hunted most often were the oryx, addox, ibex, gazelle, ostrich, hyena, lion, porcupine and sheep. Duck hunting was a favourite sport and the pintail was frequently depicted in chase scenes:

Pigeons were often caught in traps and quail were netted in fields. Large quantities of other birds were taken in clap-nets and preserved in jars. Falconry was often practised and lions were used occasionally in hunting certain mammals. The Egyptians developed hunting traditions that left behind no evidence of legal restraints on the sport.

In the culture of the early Greeks and Romans, hunting restrictions were primarily ethical. Solon did not permit the Athenians to hunt because he believed they hunted too frequently at the expense of the 'mechanical arts'.

Other leaders of the Greeks had different views. Xenophon asserted that 'the chase' was excellent training for soldiers. He said that men who had been hunters 'would not break down', could sleep in the field under conditions of great discomfort, and would obey orders faithfully. He believed experienced hunters would be more adept at surviving in severe field conditions and would usually be more courageous than non-hunters.

In Book Eight of *The Republic*, Plato notes in a discussion between Socrates and Adeimantus that the ideal timocratic man is a 'lover of gymnastic exercises and of the chase'. He implies that the chase is a 'necessary pleasure', one of those "of which we cannot get rid and of which the satisfaction is a benefit to us . . . because we are framed by nature to desire both what is beneficial and what is necessary, and cannot help it."

In Book Seven, Plato outlines the Greek hunting concept in great detail. Regular hunting was allowed but the use of nightlights, nets and other devices to take game was not permitted. It is clear that game species were for hunting rather than commercial exploitation.

Much later, the Roman emperor Justinian realized that landowners had the right to forbid others to kill game on their property, but the issue was apparently one of trespass, not conservation.

The early Greeks were not permitted to hunt on holy days nor were they allowed to hunt at night near towns for fear of depleting local wildlife stocks, thus enabling Greek youths to experience many joys of the chase in nearby areas.

Possibly the first instance of successful game management was practised in the Mongol Empire. The law code or Yassa of Genghis Khan, proclaimed in 1206 A.D., stated in Law 9 "To keep the men of the army exercised, a great hunt shall be held every winter. On this account, it is forbidden any man of the Empire (southeast Asia) to kill from the Month of March to October deer, bucks, roebucks, hares, wild ass and some birds." Great hunts, involving 200,000 men and lasting four months each, were conducted annually during the reign of the Khan.

Kublai Khan, the grandson of Genghis, continued this tradition and added more species to the protected list. Offenders were punished severely and it is evident that the restriction was intended to allow adequate reproduction of game species.

The Khan's management of game was not limited to hunting regulations. Near Changanor in Cathay, his game managers maintained large populations of cranes, pheasants

Color-coated hunt cup, Romano-British, late 2nd or early 3rd century, found near Wansford in 1841. A hunstman is about to spear a stag, and a second baits a bear with a whip. Photo, courtesy of Royal Ontario Museum.



and partridges through winter feeding programs. Nearby fields were sown every year with millet and other seeds suitable for birds, and no one was permitted to harvest these crops. Many game keepers were employed to enforce the hunting laws and feed game animals.

So that the Khan might hunt birds and mammals regularly (occasionally using gyrfalcons and hawks), he ordered that roadside huts be built as winter shelters for quail and pheasants. It is certain that such management practices had evolved over a long period of time, and it is evident that the elaborate arrangements were intended to

produce game for the private enjoyment of the Khan, himself.

In feudal Europe about 1400, hunting was practised legally by the ruling class only, and it has been suggested that hunting controls developed from customs rather than laws. Thus, the red deer season in Britain opened at St. Johns Tide (June 24) and closed on Holyrood Day (September 14). It is no coincidence that the interval corresponded to the period of optimum meat condition and quantity of fat of the red deer. A buck law was observed during the reign of Henry IV and 'unwarrantable' sex and age classes were not taken.

Hunting custom, rather than law, also restricted the methods of taking game. In France in the 15th century, deer were taken with hounds, nets, cords, harnesses, bows and traps, while in Britain only hounds and bows were used. It is possible that certain hunting taboos resulted from class-specific inhibitions rather than attempts at conservation.

Henry VII (1485-1509) was the first English king to recognize the trespass rights of landowners. The hunting of pheasants and other game birds on private land was forbidden except with permission. Herons could be taken legally only by falconry or the long bow.

The first severe penalties for nest robbing were introduced during the reign of Henry VIII. Nonetheless, such practices are still common in Britain and other countries.

Predators were not controlled apparently until the period when bounties from taxes on local land were paid for crows and rooks. It is not surprising that the first species bountied were black in color because universal dislike and fear of black creatures date from the early Stone Age, and remnants of the same phenomenon appear in modern wildlife regulations in many jurisdictions.

Elizabeth I increased the number of species for which bounties might be paid (kingfisher, weasel, wildcat, cormorant, buzzard, bullfinch and many others) and bounty funds were raised by increasing local land taxes. The night hunting of pheasants was prohibited at this time.

By 1625 all shooting was prohibited on private land except with permission. The first migratory bird refuge (a heronry) was declared by James I.

Before the white man arrived in North America, the Indians believed that all ani-

mals were gifts from the gods of the forest or water (variously named depending on linguistic associations) and they killed every edible animal they could find except for a few with religious significance. There are many early records of Indians killing vast quantities of buffalo, caribou, etc. — much more than they could consume. They believed that failure to take advantage of the gifts of the gods would result in the gods' refusal to provide animals in the future.

There are no records of hunting restrictions among the Jesuit priests in the 17th century. However, in the United States in 1623, hunting and fishing rights were granted to all residents of the Plymouth settlement.

Before the American Revolution, all but one of the 13 colonies observed closed seasons on some game species at certain times, and several colonies restricted the methods of taking game. The first deer season was declared in Massachusetts in 1718.

The first non-game bird protection was legislated in New Jersey in 1850, and the first bag limit apparently occurred in Iowa in 1878 (25 prairie chickens daily). The first migratory bird refuge on the continent was established at Last Mountain Lake in 1887.

From the Norman Conquest in 1066 until 1215, the English kings claimed all wildlife for themselves and they distributed it as they wished. However, the Magna Carta provided that, although the king still owned the wildlife, his ownership was only in trust for his subjects.

This is still the legislative point of view in North America where the appropriate level of government retains ownership of wildlife by *ad hoc* convention. If propagated in captivity under a permit, some species of wildlife may belong to an individual and he is permitted to dispose of them according to regulation. However, once these animals are released from captivity, their ownership reverts to the public.

In North America, the earliest concepts of colonists and the progressive formation of individual governments led to the decision, although undocumented, that non-migratory mammals and birds belong to provinces and states, and that migratory birds are federal responsibilities.

The accompanying examples of old game laws, selected from the British experience, show that man has long been preoccupied with the problems arising from the hunting

of game and the control of hunters. Only the enforcement of the law has been altered radically and poachers are no longer mutilated or executed. Our hunters may be similar to the sportmen of long ago but our poachers are possibly a less inventive lot.

HIGHLIGHTS BRITISH FISH AND WILDLIFE LAWS

Henry II

Carta of the Forest.

John I

Assize of Woodstock

John I

Magna Carta

Richard I: Statute

Relates to such persons as shall not have or keep any Greyhound, Hound, or other Dog to hunt, and shall not use Fyrets, Heys, Nets, Hare-pipes, Cords or other Engines to take or destroy Hare, Conies, or other Gentlemen's Game.

Edward IV: Statute

Relates to the having any Mark or Game of Swans.

Henry VII: Act

Against taking of Feasaunts and Partridges; and, De Laqueis et Retibus Venantium.

Henry VIII: Act

Against tracing of Hares; and, against Destruction of Wild Fowl; and, an Act concerning Cross Bows and Hand Guns.

Elizabeth I: Act

For the Preservation of Pheasants and Partridges.

James I: Act

For the better Execution of the Intent and Meaning of former Statutes made against shooting in Guns, and for the Preservation of the Game of Pheasants

and Partridges, and against the destroying of Hares with Hare Pipes, and tracing Hares in the Snow; and, to prevent the Spoil of Corn and Grain by untimely hawking, and for the better Preservation of Pheasants and Partridges.

Charles II: Act

For the better Preservation of the Game, and for securing Warrens not inclosed, and the several Fishings of this Realm.

William and Mary: Act

For the more easy Discovery and Conviction of such as shall destroy the Game of this Kingdom.

Anne: Act

For the better Preservation of the Game; and, for making the Act of the Fifth Year of Her Majesty's Reign, for the better Preservation of the Game, perpetual, and for making the same more effectual.

George I: Act

For the better Recovery of Penalties inflicted upon Persons who destroy the Game.

George II: Act

For continuing an Act for the more effectual punishing of wicked and evil-disposed Persons going armed in Disguise, and doing Injuries and Violences to the Persons and Properties of His Majesty's Subjects, and for the more speedy bringing the Offenders to Justice; and for continuing Two Clauses, to prevent the cutting or breaking down the Bank of any River or Sea Bank, and to prevent the malicious cutting of Hopbinds, contained in an Act passed in the Sixth Year of His present Majesty's Reign; and for the more effectual Punishment of Persons removing any Materials used for securing Marsh or Sea Walls or Banks and of Persons maliciously setting on Fire any Mine, Pit, or Delph of Coal or Canned Coal, and of Persons unlawfully hunting or taking any Red or Fallow

Deer in Forests or Chases, or beating or wounding Keepers or other Officers in Forests, Chases, or Parks; and, for more effectually securing the Breed of Wild Fowl.

George II: Act

To amend an Act made in the Eighth Year of the Reign of His Majesty King George the First, intituled 'An Act for the better Recovery of the Penalties' inflicted upon Persons who destroy the Game, by enlarging the Time within which Suits and Actions are to be brought by force of the said Act.

George II: Act

To explain and amend a Clause in an Act made in the Fifth Year of the Reign of Queen Anne, intituled 'An Act for the better Preservation of the 'Game', in relation to the selling or offering to Sale any Game.

George III: Act

For the better Preservation of the Game in that Part of Great Britain called England; and, to explain and amend the several Laws now in being, so far as the same relate to the Preservation of the Moor or Hill Game.

George III: Act

To repeal an Act made in the Tenth Year of the Reign of His present Majesty, intituled 'An Act for the better Preservation of the Game within that 'Part of Great Britain called England,' and, for making other Provisions in lieu thereof.

George III: Act

For repealing Two Acts passed in the Thirty-sixth Year of the Reign of His present Majesty, which limit the Time for killing Partridges in England and Scotland, and for amending so much of an Act passed in the Second Year of the Reign of His present Majesty as relates to such Limitation within that Part of Great Britain called England, by making other Provisions for that Purpose.

George III: Act

For the better Preservation of Heath Fowl, commonly called Black Game in the New Forest in County of Southampton.

George III: Act

To repeal so much of an Act of the First Year of King James the First as relates to the Penalties on shooting at Hares; and also to repeal an Act of the Third Year of King George the First, relating to Gamekeepers.

George III: Act

For the better Preservation of Heath Fowl, commonly called Black Game, in the Counties of Somerset and Devon.

George III: Act

For the more effectual Prevention of Offences connected with the unlawful Destruction and Sale of Game.

George III: Act

For the further regulating the Appointment of Gamekeepers in Wales.

George IV: Act

For the more effectual Prevention of Persons going armed by Night for the Destruction of Game.

William IV: Act

To amend the Laws in England relative to Game.

Victoria: Act

To extend an Act of the Ninth Year of King George the Fourth, for the more effectual Prevention of Persons going armed by Night for the Destruction of Game.

Victoria: Act

For the Prevention of Poaching.

Victoria: Act

Ground Game Act.

Kharesmian hunting scene, 13th century.



